

What Is Claimed Is:

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1. A high stability, low emission, invert
fuel emulsion composition for an internal combustion
5 engine comprising purified water; hydrocarbon
petroleum distillate fuel as the continuous phase of
the emulsion; and a surfactant package comprising
primary surfactant, block copolymer, and polymeric
dispersant, said emulsion being made by a continuous
10 flow process comprising the steps of:

a) blending a flow of additives comprising
said surfactant package and a flow of said hydrocarbon
petroleum distillate fuel in a first in-line blending
station;

15 b) blending a flow from the in-line blending
station of step a) with a flow of said purified water
in a second in-line blending station;

c) aging the composition from the second in-
line blending station of step b) in a reservoir;

20 d) passing the aged composition from step
c) through a shear pump to a storage tank.

2. The invert fuel emulsion composition of
claim 1 comprising 5-50 wt % purified water and 50-95
25 wt. % hydrocarbon petroleum distillate fuel.

3. The invert fuel emulsion composition of
claim 1 comprising at least 4000 ppm primary
surfactant.

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4. The invert fuel emulsion composition of
claim 3 wherein said primary surfactant is an amide.

5. The invert fuel emulsion composition of
35 claim 4 wherein said primary surfactant is selected
from the group consisting of unsubstituted, mono- and
di-substituted amides of saturated C₁₂-C₂₂ fatty acids

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and unsubstituted, mono- and di-substituted amides of unsaturated C₁₂-C₂₂ fatty acids,

wherein said mono and di substituted amides are substituted by substituents selected, independently of each other, from the group consisting of straight and branched, unsubstituted and substituted alkyls having 1 to 4 carbon atoms, straight and branched, unsubstituted and substituted alkanols having 1 to 4 carbon atoms, and aryls.

6. The invert fuel emulsion composition of claim 5 wherein said primary surfactant is a 1:1 fatty acid diethanolamide of oleic acid.

7. The invert fuel emulsion composition of claim 1 comprising from about 1,000 ppm to about 5,000 ppm block copolymer.

8. The invert fuel emulsion composition of claim 7 wherein said block copolymer is an EO/PO block copolymer.

9. The invert fuel emulsion composition of claim 8 wherein said block copolymer is selected from the group consisting of PLURONIC 17R2, PLURONIC 17R4, PLURONIC 25R2, PLURONIC L43, PLURONIC L31, AND PLURONIC L61.

10. The invert fuel emulsion composition of claim 9 wherein said block copolymer is octylphenoxypolyethoxyethanol (PLURONIC 17R2).

11. The invert fuel emulsion composition of claim 1 comprising about 100 ppm to about 1,000 ppm polymeric dispersant.

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12. The invert fuel emulsion composition of claim 11 wherein said polymeric dispersant is ICI HYPERMER E-464.

5 13. The invert fuel emulsion composition of claim 1 comprising
10-50% purified water;
50-90% hydrocarbon petroleum distillate
fuel;
10 at least 4000 ppm amide primary emulsifier;
between about 2000 and about 3000 ppm EO/PO
block polymer; and
between about 600 and about 800 ppm
polymeric dispersant.

15 14. The invert fuel emulsion composition of claim 13 wherein said amide primary surfactant is Schercomid SO-A (Scher Chemical).

20 15. The invert fuel emulsion composition of claim 13 wherein said block copolymer is Pluronic 17R2 (BASF).

25 16. The invert fuel emulsion composition of claim 13 wherein said polymeric dispersant is Hypermer E-464 (ICI).

30 17. The invert fuel emulsion composition of claim 1 said emulsion having an average droplet size of less than about 5 microns.

35 18. The invert fuel emulsion composition of claim 17 said emulsion having an average droplet size of about 1 micron or less.

19. The invert fuel emulsion composition of

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claim 18 said emulsion having an average droplet size ranging from about 0.1 microns to about 1 micron.

20. The invert fuel emulsion composition of
5 claim 1 further comprising one or more additives
selected from the group consisting of lubricants;
corrosion inhibitors; antifreezes; and ignition delay
modifiers.

10 21. The invert fuel emulsion composition of
claim 20 wherein said flow of additives of step a) is
comprised of said surfactant package and said one or
more additives.

15 22. The invert fuel emulsion composition of
claim 21 wherein said flow of additives of step a) is
comprised of a blended flow of a flow of an antifreeze
and a flow of said additives blended in a third in-
line blending station.

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